ABSTRACT OF THE DISCLOSURE

[0033] Apparatus and method receives and reorders a multi-dimensional signal transmitted through a communication channel using a slicer/encoder coupled to a pair-swap and symbol alignment module. The slicer/encoder uses a code that reduces the number of bits for each symbol in the multidimensional signal as required to pass through the pair-swap and symbol alignment module that detects and corrects pair-swap and symbol misalignment in the multidimensional signal. Decoders reverse the encoding done on the multidimensional signal by the encoder, and correct errors that occurred in the transmission of multidimensional signal over the communication channel. Serialized circuitry and performance of symbol alignment and pair-swap reordering in one pass significantly reduce circuitry and power consumption.